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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re Application of:

Jaron Z. Lanier, et al.

Serial No. 09/217,595

Filed: December 22, 1998

For: METHOD AND SYSTEM FOR  
GENERATING OBJECTS FOR A  
MULTI-PERSON VIRTUAL  
WORLD USING DATA FLOW  
NETWORKS

§ Group Art Unit: 2183  
§  
§ Examiner: Treat, William M.  
§  
§ Atty. Dkt. No.: 5181-10802

U.S. DEPARTMENT OF PATENT  
AND TRADEMARK OFFICE  
WASHINGTON, DC 20514

**CERTIFICATE OF MAILING**  
**37 C.F.R. § 1.8**

I hereby certify that this correspondence is being deposited with the U.S. Postal Service with sufficient postage as First Class Mail in an envelope addressed to: Commissioner for Patents, Washington, D.C. 20231, on the date indicated below:

Robert C. Kowert  
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February 19, 2002  
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# REPLY BRIEF

**Attn: Board of Patent Appeals and Interferences**  
**Commissioner for Patents**  
**Washington D.C. 20231**

Sir/Madam:

In response to the Examiner's Answer mailed January 29, 2002, Appellants present this Reply Brief. Appellants respectfully request that this reply brief be entered pursuant to 37 C.F.R. § 1.193(b)(1) and considered by the Board of Patent Appeals and Interferences.

### RELATED APPEALS AND INTERFERENCES

Since the filing of the Appeal Brief and Amended Appeal Brief, a related appeal has also been filed for reissue application no. 09/159,509 owned by the same assignee as the present application. Examiner Treat is the Examiner for both the present application and for application no. 09/159,509. Both applications involve similar interpretations of the recapture doctrine by Examiner Treat.

### GROUPING OF CLAIMS

In his Answer, the Examiner disagrees that claims 31-94 do not stand or fall together. Claims 31-94 each stand or fall separately because each claim must be separately analyzed to determine whether or not it is broader than the patent claims, whether or not it recaptures surrendered subject matter, and whether or not it has been materially narrowed in other respects to avoid the recapture rule. Since the Examiner has not specifically met his burden of explaining how each step of the three-step recapture rule test is satisfied for each separate claim, as further discussed below, Appellants assert that each of claims 31-94 stands or falls separately.

### REPLY TO EXAMINER'S ANSWER

#### 1. Claims 1-30

Claims 1-30 correspond to claims 1-30 of the patent (5,588,139) for which reissue is sought. Appellants assert that the reissue declaration properly states errors by which the patentees claimed less than they had a right to claim in the original patent and that these errors arose without deceptive intent. As shown below, the new claims submitted to address these errors do not impermissibly recapture surrendered subject matter. Thus, the reissue declaration states errors properly correctable through reissue and claims 1-30 should be allowed.

2. Claims 31-94

The Examiner rejected claims 31-94 under 35 U.S.C. § 251 and the recapture rule. The Examiner's reasons for applying the recapture rule can be found on pp. 2-4 of the Office Action of June 21, 2000, and pp. 4-11 of the Examiner's Answer. In light of the following remarks, Appellants assert that the Examiner has incorrectly applied the recapture rule and has failed to state a *prima facie* rejection for each claim.

First, Appellants assert that none of the claims impermissibly recapture surrendered subject matter. The prosecution history is examined to determine whether an applicant surrendered particular subject matter. *In re Clement*, 45 USPQ2d 1161, 1164 (Fed. Cir. 1997); *Mentor Corp. v. Coloplast, Inc.*, 27 USPQ2d 1521, 1524-25 (Fed. Cir. 1993); *Ball Corp. v. United States*, 221 USPQ 289, 294-95 (Fed. Cir. 1984). There must be clear evidence of surrender through admission that the scope of the surrendered claims was not in fact patentable. *Seattle Box Co. v. Industrial Crating & Packing, Inc.*, 221 USPQ 568, 574 (Fed. Cir. 1984). "In other words, a general 'boiler plate' sentence [that the limitations of a claim distinguish from the prior art] will not be sufficient to establish recapture." M.P.E.P. § 1412.02. Independent claims 1, 26 and 30 of the original application were amended during the original prosecution as follows:

1. (Amended) A simulating apparatus comprising:
  - modeling means for creating a model of a physical environment in a computer database;
  - first body sensing means, disposed in close proximity to a part of a first body, for sensing a [the] physical status of the first body part relative to a first reference position;
  - second body sensing means, disposed in close proximity to a part of a second body, for sensing a [the] physical status of the second body part relative to a second reference position;
  - first body emulating means, coupled to the first body sensing means, for creating a first cursor in the computer database, the first cursor including plural first cursor nodes and emulating the physical status of the first body part, the first body emulating means including a first point hierarchy and a first data flow network, the first point hierarchy for controlling a shape and an orientation of the first cursor and for attaching each of the plural first cursor nodes hierarchically with at least one other of the plural first cursor nodes, the first data flow network for controlling

motion of the first cursor and the first data flow network including a first interconnection of first input units, first function units and first output units, the first input units receiving the physical status of the first body part, each first function unit including at least one input and at least one output and calculating, based on the at least one input, a value for each of the at least one output, and the first output units for producing position and orientation values for a portion of the plural first cursor nodes;

first integrating means, coupled to the modeling means and to the first emulating means, for integrating the first cursor with the model;

second body emulating means, coupled to the second body sensing means, for creating a second cursor in the computer database, the second cursor including plural second cursor nodes and emulating the physical status of the second body part, the second body emulating means including a second point hierarchy and a second data flow network, the second point hierarchy for controlling a shape and an orientation of the second cursor and for attaching each of the plural second cursor nodes hierarchically with at least one other of the plural second cursor nodes, the second data flow network for controlling motion of the second cursor and the second data flow network including a second interconnection of second input units, second function units and second output units, the second input units receiving the physical status of the second body part, each second function unit including at least one input and at least one output and calculating, based on the at least one input, a value for each of the at least one output, and the second output units for producing position and orientation values for a portion of the plural second cursor nodes; and

second integration means, coupled to the modeling means and to the second body emulating means, for integrating the second cursor with the model.

26. (Amended) A simulating apparatus comprising:

a modeling means for creating a virtual world model of a physical environment in a computer database;

a first sensor for sensing a first real world parameter;

first emulating means, coupled to the first sensor for emulating a first virtual world phenomenon in the virtual world model, the first emulating means including a first point hierarchy and a first data flow network, the first point hierarchy for controlling a shape and an orientation of a first cursor, including plural first cursor nodes, and for attaching each of the plural first cursor nodes hierarchically with at least one other of the plural first cursor nodes, the first data flow network for controlling motion of the first cursor and the first data flow network including a first interconnection of first input units, first function units and first output units, the first input units receiving the physical status of the first body part, each first function unit including at least one input and at least one output and calculating, based on the at least one input, a value for each of

the at least one output, and the first output units for producing position and orientation values for a portion of the plural first cursor nodes;

a second sensor for sensing a second real world parameter; and  
second emulating means, coupled to the second sensor, for emulating a second virtual world phenomenon in the virtual world model, the second emulating means including a second point hierarchy and a second data flow network, the second point hierarchy for controlling a shape and an orientation of a second cursor, including plural second cursor nodes, and for attaching each of the plural second cursor nodes hierarchically with at least one other of the plural second cursor nodes, the second data flow network for controlling motion of the second cursor and the second data flow network including a second interconnection of second input units, second function units and second output units, the second input units receiving the physical status of the second body part, each second function unit including at least one input and at least one output and calculating, based on the at least one input, a value for each of the at least one output, and the second output units for producing position and orientation values for a portion of the plural second cursor nodes.

30. (Amended) A simulating method, comprising the steps of:  
creating a virtual environment;

[defining nodes of] constructing virtual objects within the virtual environment using a point hierarchy and a data flow network for controlling motion of nodes of the virtual objects wherein the step of constructing includes

attaching each node of the virtual objects hierarchically with at least one other of the nodes to form the point hierarchy, each of the nodes of the virtual objects having a position and an orientation, and

building the data flow network as an interconnection of input units, function units and output units, wherein said input units receive data from sensors and output the received data to at least one of said function units, wherein each of said function units includes at least one input and at least one output, each function unit generating a value for the at least one output based on at least one of data received from at least one of the input units and data received from an output of at least one other of said function units, and wherein the output units generate the position and the orientation of a portion of the nodes of the virtual objects;

inputting data from sensors worn on bodies of at least two users;  
converting the inputted data to position and orientation [values]

data;

[associating] modifying, by using the data flow network, the position and the orientation [data with said] of the nodes of the virtual objects based on the position and orientation data;

determining view points of said at least two users;  
receiving a synchronization signal;  
calculating [an] image [frame] frames for each eye of each of said  
at least two users;  
displaying the image frames to each of said eyes of said at least  
two users;  
obtaining updated position and orientation values of said at least  
two users;  
determining if the virtual environment has been modified;  
redefining positions and orientations of the nodes of the virtual  
object [nodes] if the virtual environment has been modified;  
recalculating the image frames for each of said eyes of said at least  
two users; and  
displaying the recalculated image [frame] frames to each of said  
eyes of said at least two users.

Accompanying this amendment, Applicants argued that the Waldren reference did not teach or suggest "the first emulating means including a first point hierarchy and a first data flow network, the first point hierarchy for controlling a shape and an orientation of a first cursor,... [and] the second emulating means including a second point hierarchy and a second data flow network, the second point hierarchy for controlling a shape and an orientation of a second cursor...." See pp. 15-17 of the Amendment filed March 8, 1996, in the original application.

Thus, the prosecution history of the original application reveals that the focus of Applicants' amendments and arguments was to distinguish from the cited art by further defining the emulating means of claims 1 and 26 and the constructing step of claim 30. Appellants note that independent claims 31, 66, 72, 77, 90 and 94 in the present reissue application all include at least some additional definition of the corresponding emulating or constructing elements beyond what was present in the surrendered claims (i.e. original claims before amendment). For example, all of the independent claims in the present reissue application refer to emulating a body in a three-dimensional environment by changing one or more attributes of a cursor, wherein the cursor comprises a plurality of nodes configured as a point hierarchy. This limitation is clearly germane to the rejection in the original application. Furthermore, this limitation was not present in the surrendered (original) claims. Since the present claims are narrower than the original

claims in a manner germane to the original rejection, the recapture rule does not apply.

The Federal Circuit recently clarified that "application of the recapture rule is a three-step process." *Pannu v. Storz Instruments, Inc.*, 59 USPQ2d 1597, 1600 (Fed. Cir. 2001). When performing the first step of the three-step process of applying the recapture rule, the reissue application claims are compared to the patent claims to determine what aspects of the claims have been broadened. *Id.*; *Clement*, 45 USPQ2d at 1164. However, when performing the second step in applying the recapture rule to determine if surrendered subject matter is now being claimed, the reissue application claims are compared to the surrendered claims (i.e. the claims prior to cancellation or amendment during the original prosecution). *Hester Indus., Inc. v. Stein, Inc.*, 46 USPQ2d 1641, 1649 (Fed. Cir. 1998); *Clement*, 45 USPQ2d at 1164-65; *Ball*, 221 USPQ at 295-96; *In re Richman*, 161 USPQ 359, 362-63 (C.C.P.A. 1969) ("The question raised to whether the appealed claims are of the same scope as the cancelled claims, not whether they lack some specific recitation absent from the cancelled claims but included in the patent claims."). Here, the surrendered claims are represented by claims 1, 26 and 30 prior to the amendment of March 8, 1996. Thus, the surrendered claims are as follows:

1. A simulating apparatus comprising:
  - modeling means for creating a model of a physical environment in a computer database;
  - first body sensing means, disposed in close proximity to a part of a first body, for sensing the physical status of the first body part relative to a first reference position;
  - second body sensing means, disposed in close proximity to a part of a second body, for sensing the physical status of the second body part relative to a second reference position;
  - first body emulating means, coupled to the first body sensing means, for creating a first cursor in the database, the first cursor emulating the physical status of the first body part;
  - first integrating means, coupled to the modeling means and to the first emulating means, for integrating the first cursor with the model;
  - second body emulating means, coupled to the second body sensing means, for creating a second cursor in the database, the second cursor emulating the physical status of the second body part; and
  - second integration means, coupled to the modeling means and to the second body emulating means, for integrating the second cursor with the model.

26. A simulating apparatus comprising:  
a modeling means for creating a virtual world model of a physical environment in a computer database;  
a first sensor for sensing a first real world parameter;  
first emulating means, coupled to the first sensor for emulating a first virtual world phenomenon in the virtual world model;  
a second sensor for sensing a second real world parameter; and  
second emulating means, coupled to the second sensor, for emulating a second virtual world phenomenon in the virtual world model.

30. A simulating method, comprising the steps of:  
creating a virtual environment;  
defining nodes of virtual objects within the virtual environment;  
inputting data from sensors worn on bodies of at least two users;  
converting the inputted data to position and orientation values;  
associating the position and orientation data with said nodes;  
determining view points of said users;  
receiving a synchronization signal;  
calculating an image frame for each eye of each of said users;  
displaying the image frames to each of said eyes of said users;  
obtaining updated position and orientation values of said users;  
determining if the virtual environment has been modified;  
redefining the virtual object nodes if the virtual environment has been modified;  
recalculating the image frames for each of said eyes of said users;  
and  
displaying the recalculated image frame to each of said eyes of said users.

Appellants are clearly not attempting to recapture the surrendered claims. All of the independent claims of the present reissue application are materially narrower than the surrendered claims, and the aspects by which they are broader than the surrendered claims are not material. "[I]f the reissue claim is narrower in an aspect germane to the prior art rejection, and broader in an aspect unrelated to the rejection, the recapture rule does not bar the claim." *Clement*, 45 USPQ2d at 1165. See also, *Ball*, 221 USPQ 289; *In re Wadlinger*, 181 USPQ 826 (C.C.P.A. 1974); *Richman*, 161 USPQ 359; *In re Willingham*, 127 USPQ 211 (C.C.P.A. 1960).

The present reissue claims do not present a typical recapture scenario, such as in



*Clement* or *Mentor*, where the reissue claims seek to revert back to the language of the surrendered claim without otherwise materially narrowing the claim. Instead, the present reissue claims present a situation similar to the reissue claims in *Ball*, *Wadlinger*, *Richman* and *Willingham* where the reissue claims were materially more narrow than the surrendered claim and thus held to not be subject to the recapture rule. For example, all of the independent claims in the present reissue application include the material limitation of emulating a body in a three-dimensional environment by changing one or more attributes of a cursor, wherein the cursor comprises a plurality of nodes configured as a point hierarchy. This limitation is similar to the limitation that was argued by Applicants in the amendment of March 8, 1996 after which the application was allowed. Thus, this limitation is clearly material to the original rejection and all of the reissue application claims are clearly more narrow than the surrendered claims in this material aspect. The Examiner's main point of confusion is his assertion that this limitation must be exactly the same as it appeared in the original amendment of March 8, 1996. The Examiner is clearly in error on this point. To avoid recapture, the reissue claims only need be narrower in an aspect "germane to the prior art rejection." *Clement*, 45 USPQ2d at 1165. "Germane" does not mean "exactly the same" as contended by the Examiner. As Judge Rich stated in regard to recapture in *Richman*, 161 USPQ at 363: "Certainly one might err without deceptive intention in adding a particular limitation where a less specific limitation regarding the same feature, or an added limitation relative to another element, would have been sufficient to render the claims patentable over the prior art."

The aspects by which the reissue application claims are broader than the surrendered claims are not material to the rejection in the original application. For example, some of the reissue application claims are broader than the surrendered claims in that they are presented in a method format, computer-readable medium format or kit format as opposed to an apparatus format. However, a change in claim format is not considered to be a material difference. M.P.E.P. § 1412.02. Also, some of the reissue claims refer to processing data from body sensors as opposed to the body sensing means of original claim 1. However, this claim element was never material to overcoming the

rejection during the original prosecution. No aspect of the "body sensing means" was argued to distinguish from the prior art. Since Applicants made no admission that any aspect of the "body sensing means" was required to overcome the rejection, the recapture rule does not apply. *Seattle Box*, 221 USPQ at 574. Similarly, some of the reissue claims refer to positioning the cursors within the virtual environment and integrating the cursors into a database for the virtual environment, as opposed to the modeling means and integrating means of original claim 1. But again, these elements were never at issue in the original prosecution. As discussed above, in regard to the claim elements that were germane to the rejection, the reissued claims are narrower than the surrendered claims. Therefore, the reissue application claims fall directly into the "(3)(b)" category stated in *Clement* where "if the reissue claim is narrower [than the surrendered claims] in an aspect germane to the prior art rejection, and broader in an aspect unrelated to the rejection, the recapture rule does not bar the claim." *Id.* at 1165.

Even if some other limitation found in the surrendered claims were material, the absence or broadening of such a limitation in the reissue claims does not invoke the recapture rule because all of the reissue claims have been materially narrowed by inclusion of the material limitation discussed above (emulating a body in a three-dimensional environment by changing one or more attributes of a cursor, wherein the cursor comprises a plurality of nodes configured as a point hierarchy). "Reissue claims that are broader in certain aspects and narrower in others may avoid the effect of the recapture rule." *Mentor*, 27 USPQ2d at 1525. For example, in *Ball* the reissue claims omitted the specific limitation that had originally been added to the claim at the Examiner's suggestion to obtain allowance. *Id.* at 291-93. However, the reissue claims were narrowed in another material aspect such that the Federal Circuit held that the recapture rule did not apply even though the very limitation used to obtain allowance in the original application had been removed from the reissue claims. *Id.* at 295-96; see also *Richman* at 363.

Moreover, Appellants note that certain ones of the present claims include

language similar to the original amendment, such as claims 45, 46 and especially claim 94. However, the Examiner has not provided any separate analysis of these claims.

Second, Appellants assert that the Examiner has failed to state a *prima facie* rejection for each claim according to the recapture rule. "Application of the recapture rule is a three-step process." *Pannu*, 59 USPQ2d at 1600. The first step is to "determine whether and in what 'aspect' the reissue claims are broader than the patent claims." *Id.* "The second step is to determine whether the broader aspects of the reissue[] claim relate[] to surrendered subject matter." *Id.* Finally, it must be determined whether the reissue claims are materially narrower in other respects to avoid the recapture rule. *Id.* As stated in section 1412.02 of the MPEP, "the Examiner must first review each claim for the presence of broadening." MPEP § 1412.02 indicates that the recapture rule must be applied to each claim. However, in his rejection the Examiner only referred to the "emulate the first body..." and "emulate the second body..." elements found in some of Appellants' independent claims. For none of the claims did the Examiner identify how each step of the recapture rule was met. The Examiner only made vague references to broadening and did not identify the specific broader aspects. Nor does the Examiner explain for each claim how any broader aspects relate to surrendered subject matter. Instead the Examiner merely makes a bald assertion that material limitations from claims 1, 26 and 30 of the patent have been dropped in claims 31-94. Finally, the Examiner failed to properly apply the third step of the recapture rule by failing to analyze for each claim whether the reissue claims were materially narrowed so as to avoid the recapture rule.

The recapture rule must be applied separately to each individual claim, including the dependent claims. Appellants assert that since the Examiner has failed to clearly identify how each step of the recapture rule is satisfied for each claim, a *prima facie* rejection has not been established under the recapture rule for claims 31-94. Appellants note that the broader aspects are not the same for each independent claim. For example, independent claim 94 contains almost the exact wording of the amendment made during

the prosecution of the original application, yet the Examiner provides absolutely no explanation of how the recapture rule could possibly apply to claim 94. Clearly the analysis of the recapture rule for claim 94 is different than the analysis for claim 31, for example. However, the Examiner failed to separately analyze the claims.

Also, some of the dependent claims (e.g. claims 45 and 46) include further limitations similar to the amendment made in the original application. Thus, even if a broader aspect of one claim is impermissible recapture, the same is not necessarily true for the other claims which may not have been broadened in the same way or may have other material limitations to avoid recapture. Moreover, even if one of the independent claims was impermissibly broadened in regard to a specific aspect, one or more of the dependent claims may include that aspect to avoid recapture. The Examiner has not provided any analysis at all, let alone a specific analysis of the first two steps of the recapture rule test for each dependent claim of exactly what aspect has been impermissibly broadened. Thus, the Examiner has failed to state a *prima facie* rejection.

The Examiner also failed to properly apply the third step of the recapture rule by failing to properly analyze for each claim whether the reissue claims were materially narrowed in other respects so as to avoid the recapture rule. The Examiner did state in regard to some, but not all, of the dependent claims that he believed the difference to be immaterial as well known or trivial. However, for most of the claim limitations, the Examiner did not provide any factual basis to back up his assertion that the differences were immaterial. Merely stating that individual aspects of a claimed invention are well known does not render the combination well known without some objective reason to combine the individual teachings. *Ex parte Levengood*, 28 USPQ2d 1300. As the Federal Circuit stated in *In re Kozab*, 55 USPQ2d 1313, 1316 (Fed. Cir. 2000): "Most if not all inventions arise from a combination of old elements. However, identification in the prior art of each individual part claimed is insufficient to defeat patentability of the whole claimed invention." Conclusory statements such as those provided by the Examiner that a claim limitation is well known or trivial do not fulfill the Examiner's

obligation. *In re Sang Su Lee*, Docket No. 00-1158 (Fed. Cir. January 18, 2002). "Deficiencies of the [rejection] cannot be remedied by the [Examiner's] general conclusions about what is 'basic knowledge' or 'common sense.'" *In re Zurko*, 59 USPQ2d 1693, 1697 (Fed. Cir. 2001). "Common knowledge and common sense ... do not substitute for authority." *In re Sang Su Lee*. Common knowledge "does not in and of itself make it so" absent evidence of such knowledge. *Smiths Industries Medical Systems, Inc. v. Vital Signs, Inc.*, 51 USPQ2d 1415, 1421 (Fed. Cir. 1999). Therefore, the Examiner has not provided a proper factual basis as to why each claim fails to avoid the recapture rule.

In summary, the Examiner appears to have primarily erred by comparing the reissue application claims to the patent claims in determining whether surrendered subject matter is being recaptured. *See, e.g.*, February 1, 2000 Office Action, p. 4, paragraph 7. As noted above, the reissue claims are properly compared to the patent claims to determine what aspects have been broadened, but when determining whether the broadened aspects seek to recapture surrendered subject matter, the reissue claims are compared to the surrendered claims (i.e. the claims prior to cancellation or amendment during the original prosecution), not the patent claims. As discussed above, when properly compared to the surrendered claims, it is clear the reissue claims do not seek to recapture surrendered subject matter and are materially narrower than the surrendered claims. The Examiner further erred in not providing a separate analysis of the recapture rule for each individual claim, including the dependent claims.

Finally, Appellants note that the Examiner's assertion on p. 3 of the June 21, 2000 Office Action that the switch from the original means-plus-function claim language to other terms, is recapture. Claiming the invention in terms other than means-plus-function is not recapture because during the original prosecution Applicants did not rely on the means-plus-function format of the claims to obtain allowance. Thus, claim formats other than means-plus-function were not surrendered. Recapture only applies if there is clear evidence of surrender through admission that the scope of the surrendered claims was not

in fact patentable. *Seattle Box*, 221 USPQ at 574. "In other words, a general 'boiler plate' sentence [that the limitations of a claim distinguish from the prior art] will not be sufficient to establish recapture." M.P.E.P. § 1412.02. Applicants never relied on the means-plus-function nature of the claims to distinguish from the prior art during the original prosecution.

### CONCLUSION

For the foregoing reasons, it is submitted that the Examiner's rejection of claims 1-94 was erroneous, and reversal of the Examiner's decision is respectfully requested.

This Reply Brief is submitted in triplicate along with a return receipt postcard.

Respectfully submitted,



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